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(54) Title: UNITARY CONTAINER AND CAP ASSEMBLY

(57) Abstract: The present invention (10, 11) provides a unitary container (20) and cap assembly (30) that has features permitting the assembly (10, 11) to be joined to other assemblies also having profiles.

WO 02/28736 A1

WO 02/28736

PCT/US00/27274

## UNITARY CONTAINER AND CAP ASSEMBLY

**BACKGROUND OF THE INVENTION**

5 Unitary cap and containers provided are known in the art, particularly as product packaging. However, these prior art constructions generally have no utility beyond the storage, retention, and/or packaging of an item.

The prior art teachings include some efforts to provide product packaging having further use as a toy or the like. U.S. Patent no. 5,447,249 discloses containers 'having respective, 10 mutually engageable connecting parts at the top and bottom end of the container which, when engaged with complementary connection parts of another container, provides a resilient clamping force therebetween. Further, the container has a top end having a laterally extending annular flange and a bottom end. The flange and bottom end of the container have the connecting parts which enable a plurality of containers to be interconnected.

15 "The connection parts are comprised of an opening or recesses and complementary pegs. Preferably, the pegs and recesses are respectively located at the bottom and top ends of the container with the recesses located within the flange. A peg of one container is inserted into a recess of an adjacent container, and a clamping force is used to keep the peg engaged in the recess and prevent inadvertent removal. The clamping force is provided by the dimensional characteristics 20 of the peg in relation to the recess, at least a portion of the recess being smaller than the peg to provide a clamping engagement with the peg. The recess can be circular and closed, or arcuate and more than 180 degree. The clamping force is provided by the radial displacement or distortion of the flange material adjacent the recess when the peg is inserted in the recess. In this respect, the larger peg being inserted in the smaller recess causes radial displacement or distortion of the flange 25 adjacent the recess, which thereby causes the clamping force." See '249 Patent at col. 2 lines 35 - col. 3 line 32.

U.S. Patent no. 5,709,304 discloses "a container (10) for sandwiches or the like including a lid (12) hinged at (14) by a living hinge in a known manner to a base section (16). Container (10) 30 may be used for hamburgers and other sandwiches as well as salads, potatoes, breakfast foods, or the like. Such containers, with the exception of the projections (20) and sockets (18), are commonly available in fast-food restaurants.

WO 02/28736

PCT/US00/27274

"Projections (20) are provided on the lid (12) of container (10) and sockets (18) are provided on the underside of base (16). As illustrated in FIG. 1, it can be seen that the sockets (18) project into the inside of the bottom wall of base (16).

"The projections (20) are dimensioned so that each will fit into the sockets (18) with a reasonably snug fit to create a coupling action between respective plural containers of the type of FIGS. 1 and 2." See '304 patent at col. 3 lines 12-27.

U.S. Patent no. 5,310,071 discloses "a sealable food container /building block element comprising an upper portion and a bottom portion, said upper portion being open, characterized in that at least one of said upper portion and said bottom portion is provided with at least one connecting means, such that a plurality of said container/elements are connectable to one another by engaging said connecting means and sliding toward each other along said connecting means, for use of said container/elements as a toy after completing original use as a food container." See the '071 patent at col. 2 lines 32-42.

#### SUMMARY OF THE INVENTION

In one embodiment of the present invention, the unitary cap and container assembly, in which the cap and container are joined to each other by a hinge, has at least one mating profile permitting joinder of the assembly to at least one other assembly. The assembly may have a tubular shape and is closed at the container bottom and open at the upper container end. The container bottom and the upper end of the container are provided with profiles that allow the assembly to be joined to similar assemblies which also are provided with complimentary profiles. Also, the cap portion of the assembly may be provided with a profile that allows it to be joined to the profiles of another assembly, such as the profile at the top of the container structure or a profile provided at the bottom of the container structure. Since assemblies can be joined together, a person can construct any number of things. Thus, the present invention has an initial utility as a container or packaging of an item, and then, at a subsequent time, has a second utility as toy, an item of amusement, or even as the medium in which an artistic vision or a design is expressed. To give an example, the assembly can be used by a manufacturer to package a consumer good such as candy. After the candy is sold to the consumer and is eaten or otherwise removed from the assembly, the assembly can be joined to other assemblies by locking the complimentary profiles of each container. It should be readily apparent that because each assembly has further utility as a structural component, the consumer has a reason to purchase additional items packaged in the assembly, since the consumer will ordinarily need a number of the assemblies in order to create the

WO 02/28736

PCT/US00/27274

things that he or she envisions constructing.

The cap has a base with an outer periphery and a tubular skirt extending around the outer periphery of the base and perpendicular to the base. At a first end, the cap has a thumb tab for facilitating the opening and closing of the container, and at a second end the cap is attached to a hinge which is attached to the container. The thumb tab and hinge extend perpendicular to and outward from the skirt of the cap.

The opening at the upper end of the container, the size and dimensions of which can be defined by the container sidewall, constitute one profile. Another profile is provided on the container bottom, where a portion thereof may be reduced in size in order to fit within the profile at the upper end of the container (or, as the case may be, to fit over it). Such a profile can be formed by either reducing or increasing the thickness of the sidewall in the location of the profile.

A further profile can be provided on the container bottom which allows the joining of that profile to the cap of another assembly. Such a profile could be a groove formed inside container bottom, at the location adjacent the meeting of the container bottom and the container sidewall.

The groove is sized and located to receive a ridge projecting downward from the cap.

The assembly is preferably molded of plastic. In yet another embodiment, the assembly is integrally molded of the plastic to form a hinge therebetween.

In a further embodiment, the hinge of the assembly has a recess. The recess forms two elements, the first element being attached to the skirt of the cap and the second element being attached to the container. In still a further embodiment, the recess functions as a bending point during the opening and closing of the container.

The profiles do not significantly alter the shape or appearance of the assemblies. That is, while the features of the profiles may be visible upon the assembly, the functionality of the profiles should not be immediately evident, and the observer would not appreciate the functionality of the profile until he or she was shown how the assemblies can be joined together. This is in contrast to the profiles present on the containers shown in U.S. Patent nos. 5,447,249, 5,709,304, and 5,310,071, where these features significantly alter the appearance of the container. For instance, U.S. Patent nos. 5,447,249 and 5,709,304 show plugs extending out from the container sidewall and/or container bottom, and complimentary recesses or apertures which extend inward from the container sidewall and/or container top. These additional features are immediately evident, and the observer would at the very least wonder why the feature was there, if he or she did not instantaneously realize that the feature was present to enable joining of those kinds of assemblies.

WO 02/28736

PCT/US00/27274

In other words, while the inclusion of a profile on a prior art assembly effected a substantial change to shape and appearance of the assembly, the profiles or the assemblies of the present invention effect, at the most, only minor changes that are incorporated into the existing container structure.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

5           FIGURE 1 is a side plan view of one embodiment of the container and cap assemblies of the present invention having complimentary mating profiles aligned in a ready for engagement state;

          FIGURE 2 is an side plan view of another embodiment of the container and cap assembly of the present invention having complimentary mating profiles in an engaged state;

10          FIGURE 3 is a side plan view of a hinge of the assembly which joins the container and cap;

#### **DETAILED DESCRIPTION OF THE PRESENT INVENTION**

Figure 1 depicts an embodiment of the unitary cap and container assemblies 10, 11 of the present invention. The assemblies 10, 11 have a container 20 having a base 28, an internal cavity  
15   27, an outer wall 25, an upper and 21 and a lower portion 26. Optionally, the container 20 is provided with a rim 22 at the upper and 21. The assemblies 10, 11 also have a cap 30 which has a base 31 and a tubular skirt 33 extending perpendicularly and outwardly around the outer periphery of the base 31. The cap 30 has opposing ends, at one end the cap 30 has a thumb tab 36 for facilitating the opening and closing of the container, and a hinge 40 is attached at the other end  
20   which in turn is attached to the container 20. The tab 36 and hinge 40 are positioned on opposing ends of the cap and extend perpendicularly and outwardly from the skirt 33 of the cap 30.

The container may also have a flange 24 projecting radially outwardly from the outer surface 25 of the container 20. The hinge 40 may be attached to the container at the flange 24. The hinge 40 also has a recess 42 that functions as a bending point during the opening and closing of  
25   the container.

Suitable material for the assemblies include plastic (e.g. thermoplastics such as polypropylene and polyethylene). In one embodiment, the assemblies may be integrally molded of plastic. The assemblies may be produced in accordance with the operation disclosed in U.S. Patent Nos. 4,783,056 and 4,812,116 or may be produced in accordance with U.S. Patent no.  
30   5,723,085. The disclosure of these patents are incorporated by reference herein.

The recess 42 present in hinge 40 is characterized by a relatively thinner section of plastic material which bridges thicker sections 40A, 40B. The recess 42 is a location which bends

WO 02/28736

PCT/US00/27274

relatively easily and acts as the location where the hinge folds when the lid is closed, and as the location where the hinge opens when the lid is opened. The assembly 10 can be opened by applying upward pressure on the thumb tab. The assembly can be closed by applying a frontal, downward pressure upon the container top to obtain a seal. As an example, a user places his/her thumb parallel or on top of the thumb tab (i.e. the frontal portion of the container) and applies a singular downward pressure until an audible snap is heard and then verified by visual inspection of uniform cap position around the flange.

Figure 1 shows a first assembly 10 situated over a second assembly 11. The opening 23 at the upper end 21 of the container 20 of second assembly 11, the size and dimensions of which are defined by the container wall 25, constitute one profile 40. Another profile 50 is provided on the container bottom of first assembly 10. Profile 50 has a cross sectional area slightly smaller than the cross sectional area of the walls 25. In Figure 1, where a cylindrical container is shown, this is effected by reducing the outside diameter of the container in the profile region 50. In the region of the profile that is adjacent the container bottom, the profile is provided with a rim 52 which extends outward from the container. The cross sectional area of the rim is sized slightly greater than the cross sectional area of the remainder of the profile 50.

The profile 52 at the bottom of the container 20 of the first assembly 10 is sized to form an interference fit with the profile 40 corresponding to the opening of the container 20 of the second assembly 11 and remain in engagement therewith. One possible way to achieve this is to provide the profile at the bottom of the second assembly with a diameter just slightly smaller than the diameter of the opening of the container. Suitable assemblies have been machined where the differences in the profiles 50, 52 are on the order of a few thousandths of an inch, such as 0.002".

Turning to Figure 2, a further profile 60 can be provided on the container base which allows the joining of that assembly to a profile located on the cap of another assembly. In cases where the cap is provided with a ridge 62 projecting from the base 31 of the cap 30, the profile 60 on the container base 31 could include a groove 64 formed on the container bottom just inside the sidewall of the container. As shown in Figure 2, the groove 64 is positioned adjacent the junction of the container base 37 and the container sidewall 25, the groove 61 being sized and located to receive the ridge 62 that projects from the base 31 of the cap. Also, the profile 60 at the container base is sized slightly smaller than the profile 70 of the cap, so that the profile 62 at the base of the container forms an interference fit inside the skirt 33 of the cap 30. It should be understood that,

WO 02/28736

PCT/US00/27274

where the cap is sized to fit over the upper surface of the container, the profile at the bottom of the container is about the same size as the opening at the upper end of the container. Further, it should be understood that the ridge 62 can be eliminated from the profile 70 on the cap 30, thereby removing the necessity of including the groove 64 as part of the profile on the second assembly 11.

The assemblies is preferably molded of plastic. Molding the assemblies from plastic materials facilitates the formation of the various profiles used to form joined components. In yet another embodiment, the assembly is integrally molded of the plastic to form a hinge therebetween.

In a further embodiment, the hinge of the assembly has a recess. The recess forms two elements, the first element being attached to the skirt of the cap and the second element being attached to the container. In still a further embodiment, the recess functions as a bending point during the opening and closing of the container.

In one possible application, a manufacturer will first use the assembly as packaging for a consumer item, such as a candy product. On an assembly line, the assemblies will be filled with candy, the lids will be closed, and a tamper evident seal, such as a shrink wrap, will be applied over junction between the container and the cap.

The candy will subsequently be purchased by a consumer. With prior art packaging, it would be expected that consumer has made his or her product selection based only on the candy, and the packaging in which the candy can be found had little or no bearing on the selection process. However, because the present invention is an assembly, that once having served as product packaging, has a second use as a structural component used to make toys, designs, or artistic expressions. This may create an incentive for the consumer to a purchase multiple units of the thing packaged in the assembly, and to purchase additional units in the future. In essence, the need to obtain a plurality of the assemblies may foster a loyalty to the packaging, with an incidental benefit flowing to the maker or seller of the thing packaged in the assembly. For instance, a child may envision constructing a race car out of the assemblies, an artist may envision constructing a sculpture. The transformative nature of the assembly, from packaging to structural component, benefits all.

Numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the attendant claims attached hereto, this invention may be practiced otherwise than are specifically disclosed herein.

WO 02/28736

PCT/US00/27274

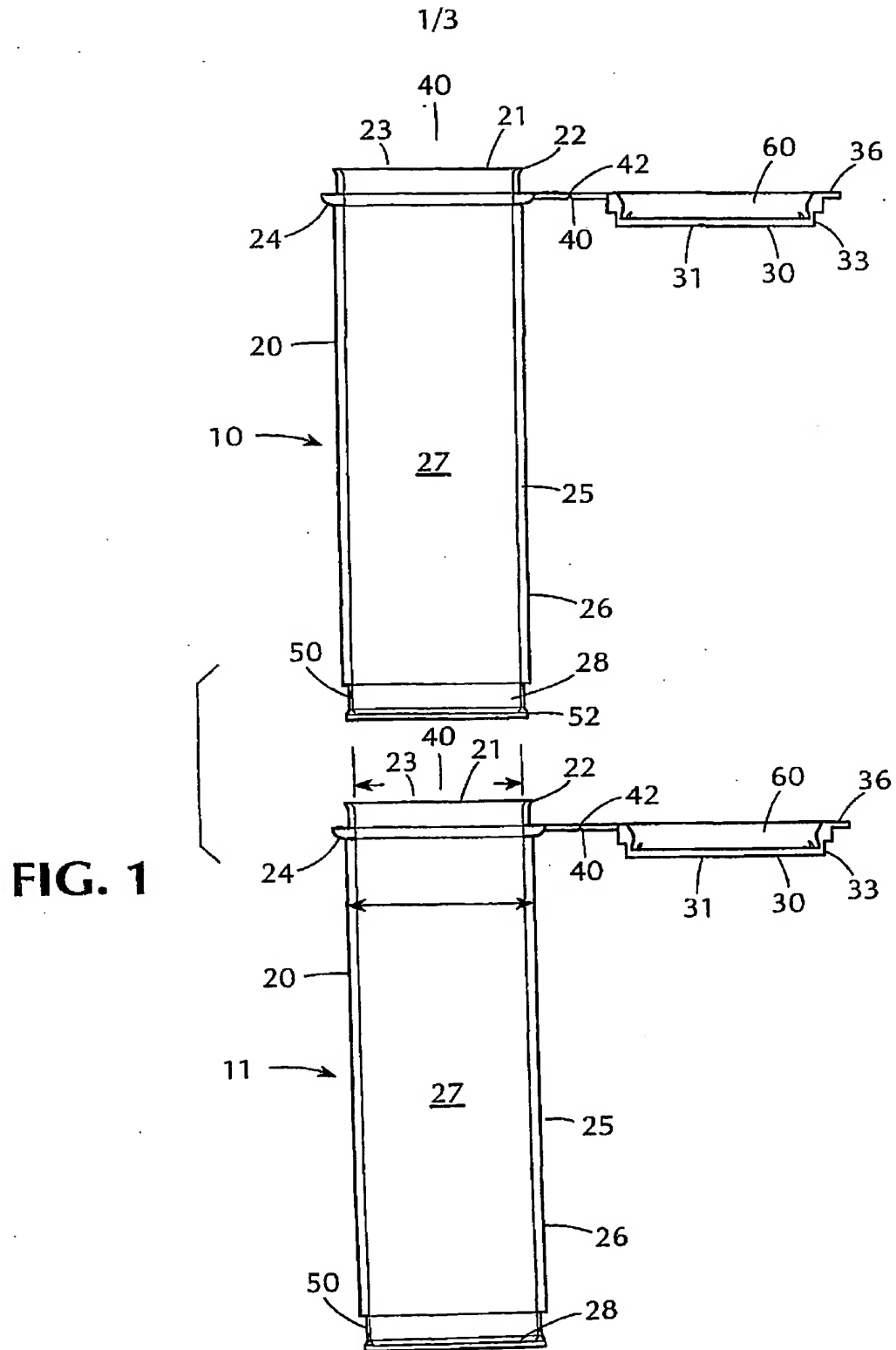
**I CLAIM**

1. A unitary cap and container assembly having a profile that enables the mating and joining of the assembly to other assemblies comprising:
  - a container having sidewalls, the container closed at a bottom end and open at an upper end;
  - 5 a cap having a base with an outer periphery and a skirt extending perpendicular to the base;
  - a hinge attached to the container and to the cap at a first end of the cap and a first end of the container;
  - 10 a tab attached to the cap at the second end of the cap which extends away from the container;
  - a profile provided on the bottom end of the container wherein the profile is dimensioned to fit within the opening of another assembly when the cap is in the open position.
2. The assembly claim 1 wherein the profile is a region extending along a portion of the sidewall of the container wherein the cross sectional area of the profile is slightly  
15 smaller than the remainder of the sidewall of the container.
3. The assembly of claim 1 wherein the bottom of the container is provided with a second profile, the second profile comprised a groove situated on the container bottom, the groove being situated to receive a ridge extending downward from on the base of the cap.
- 20 4. The assembly of claim 1 wherein the hinge has a recess, said recess forms two elements, one element being attached to the skirt of said cap and the second element being attached to the container.



WO 02/28736

PCT/US00/27274



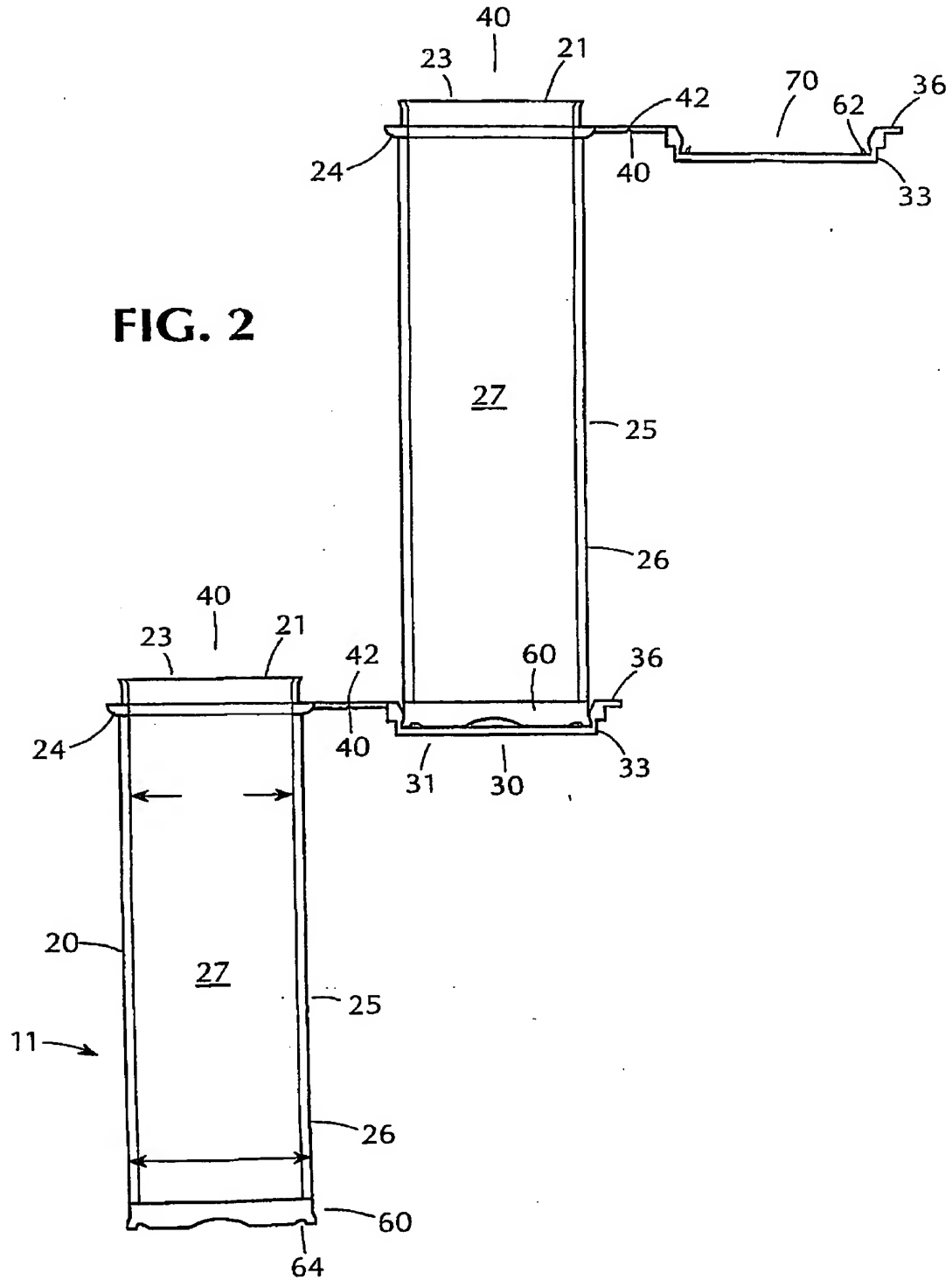
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WO 02/28736

PCT/US00/27274

2/3

FIG. 2



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WO 02/28736

PCT/US00/27274

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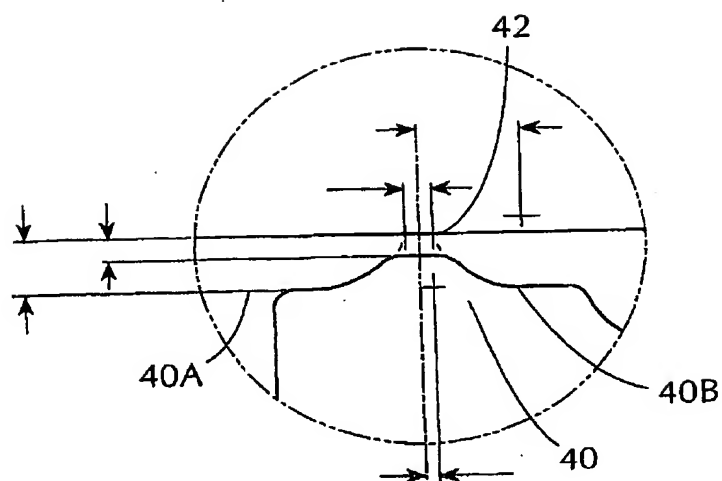


FIG. 3

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/27274

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :B65D 43/10, 43/16, 55/16

US CL :220/4.27, 23.83, 375, 379, 834, 836, 916

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 220/4.27, 23.83, 23.86, 23.6, 23.8, 212, 375, 379, 780, 810, 833, 834, 836, 916; 215/306, 317

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,312,011 A ( <i>FISCHER</i> ) 17 May 1994, see entire document.	1, 2, 3
Y		4
Y	US 5,667,094 A ( <i>RAPCHAK et al.</i> ) 16 September 1997, see entire document.	4

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

27 NOVEMBER 2000

Date of mailing of the international search report

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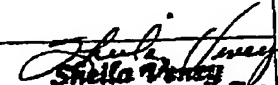
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